

side of thighs handsomely marbled with black on a yellow ground ; sometimes a light line running along the inner upper side of the tibia ; vocal sacs more or less pigmented.

Measurements.

		1.	2.	3.	4.	5.
♀.	Gensan	85	38	44	9	5½
♂.	Japan	70	35	40	8	5
♂.	„	65	35	39	8	5
♀.	„	80	40	46	10	6
♀.	„	75	38	42	9	5½
♂.	Central Japan ..	54	23	28	6	3½
♀.	„	52	21	25	6	3½
♂.	Loo Choo	63	32	37	7½	6
♂.	Chefoo	58	27	31	5½	5½
♀.	„	65	31	36	7	6
♀.	Shanghai	66	33	38	8	5
♀.	Kiu-Kiang	83	38	43	8	5
♂.	Ningpo	55	27	31	6	4
♀.	„	70	34	38	7	5

List of the Specimens.

1-2. Hgr.	S. slope of Khingham Mts., E. Mongolia.	G. E. Mason, Esq. [P.].
3. ♀.	Broughton Bay, Corea.	G. E. Mason, Esq. [P.].
4. ♀.	Gensan, Corea.	J. H. Leech, Esq. [P.].
5. ♀.	Japan.	J. H. Leech, Esq. [P.].
6-8, 9-10.	Japan.	Leyden Museum.
11-17. ♂, ♀, & yg.	Central Japan.	Dr. J. Anderson [P.].
18. ♀.	Yokohama.	Dr. J. Anderson [P.].
19. ♂.	Hakone Lake, Japan.	Dr. J. Anderson [P.].
20. ♂.	Great Loo Choo Island.	G. E. Mason, Esq. [P.].
21-28. ♂, ♀, hgr., & yg.	Chefoo.	R. Swinhoe, Esq. [C.].
29-34, 35-37, 38-39. ♂, ♀, & hgr.	Shanghai.	R. Swinhoe, Esq. [C.].
40-41. ♀ & hgr.	Mountains north of Kiu-Kiang.	A. E. Pratt, Esq. [C.].
42. ♀.	Chusan.	
43-44, 45. ♂, ♀, & yg.	Ningpo.	R. Swinhoe, Esq. [C.].
46-48. Yg.	Bangkok, Siam.	G. E. Mason, Esq. [P.].

2. Notes on some Ungulate Mammals.

By OLDFIELD THOMAS, F.Z.S.

[Received May 28, 1891.]

The following notes have been put together during the preparation of a list of the specimens of Ungulata in the British Museum Collection, and it is hoped they may help to clear up some of the difficulties in the systematic arrangement of these animals.

1. THE CHEVROTAINS.

The species of *Tragulus* appear to be rather less in number than was admitted by Prof. Milne-Edwards in his monograph of the group¹, as *T. kanchil* does not seem to be separable from *T. javanicus*. The authors' names also used by Prof. Milne-Edwards want some revision, as in two out of the four species the first mention of the animal was unaccompanied by a Latin binomial name. The following synopsis shows briefly the characters, ranges, and proper names of the four species which deserve recognition:—

- A. Body not spotted with white. Skin between rami of lower jaw naked, glandular. Malayan.
- a. Dark smoky-grey, belly greyish white without rufous or fulvous edging.
- a¹. Size large, hind foot with hoofs 140–150 millim.
Hab. S. Tenasserim, Malay Peninsula, Sumatra, and Borneo.....
- b. Rufous, at least on sides and along edges of belly.
- b¹. Bright rufous above; back of neck not darker than the rest of the upper surface. Size medium; hind foot about 130 millim.
Hab. "Sunda Islands" (*Milne-Edwards*)
- c¹. Greyish above, brightening to rufous on sides. A darker line, sometimes nearly black, along nape of neck. Size small; hind foot 110–125 millim.
Hab. Camboja, Cochin China, S. Tenasserim, Malay Peninsula, Sumatra, Borneo, and Java
- B. Body spotted with white. Chin and throat all equally hairy.
- c. Size medium; hind foot about 130–135 millim.
Hab. India and Ceylon
1. *T. napu*, F. Cuv.²
2. *T. stanleyanus*, Gr.
3. *T. javanicus*, Gmel.
4. *T. meminna*, Erxl.

The West-African Chevrotain, "*Hyomoschus*" *aquaticus*, Og., is, as stated by Pomel, Rüttimeyer, and others³, certainly congeneric with the fossil *Dorcatherium navi*, Kaup, described in 1836, nine years before Gray formed the genus *Hyomoschus*. The animal will therefore have to stand as *Dorcatherium aquaticum*.

2. LLAMAS AND ALPACA.

It is clear that the generic name of this group must be LAMA and not AUCHENIA, as Cuvier, the founder of the former name, had no more power to withdraw it than any other author. The earlier references to the two names are as follows:—

Lama, G. Cuv. Anat. Comp. i. Tabl. gén. 1800; Desm. N. Dict. d'H. N. (1) xxiv. Tabl. p. 31, 1804; G. Fisch. Zoognosia, iii. p. 351 (1814).

Lacma, Tiedem. Zool. i. p. 420 (1808).

Auchenia, Ill. Prod. S. N. p. 103 (1811); G. Cuv. R. A. i. p. 25 (1817).

Many suggestions have been made as to the true relationship that

¹ Ann. Sci. Nat. (5) ii. p. 49 (1864).

² The references to these names are all given in Prof. Milne-Edwards's paper.

³ For references, see Lydekker, Cat. Foss. Mamm. B. M. ii. p. 153 (1885).

the wild and domestic forms of *Lama* bear to each other, the most generally received view¹ being that the large burden-bearing Llama (*Lama glama*, Linn.) is the domestic race of the large wild species, the Huanaco (*Lama huanachus*, Mol.²), and that the smaller wool-bearing Alpaca (*Lama pacos*, L.) bears a similar relationship to the Vicugna (*Lama vicugna*, Mol.³).

After a careful study of the external characters, skulls, and teeth of all the four forms, I have come to the conclusion that this suggestion is untenable in one respect, namely as to the origin of the Alpaca, which appears really to be, like the Llama, a descendant of the Wild Huanaco⁴. Its size, although less than that of the Llama, is far greater than that of the Vicugna; its skull and teeth wholly agree with those of the former, and the naked patches on the legs, so distinctive of the Huanaco as compared with the Vicugna, are very often, although not always, present, the exceptions being easily explainable in the case of an animal bred and selected for generations solely with an eye to the thickness and extent of its furry covering. The occasional growth of the fur over the patches is not therefore to be wondered at.

The probabilities also are much in favour of the Peruvians having domesticated one wild species only rather than two, and of their having gradually developed two races out of it, the one large, strong, and suitable for the carriage of burdens, and the other smaller in size but exceptional in its capacity for producing a quantity of useful wool.

As to the nomenclature of the different races, it may be claimed that as the Llama, Alpaca, and Huanaco are all looked upon zoologically as one species, the earliest name for any of them (*Camelus glama*, L.) should be used for that species as a whole. It appears, however, to be infinitely better that in this, as in other similar cases, the original name should be used for the domestic race, to which it was originally given, whether the wild race of the same species is afterwards discovered with certainty or not. Thus *Capra hircus*, Linn. (1766), antedates *C. ægagrus*, Gmel. (1789), but it would only be a source of confusion, without any benefit, were the Linnean name applied to the genuine Wild Goat.

On this principle therefore the different members of the Llama group should be:—

¹ Vide Burmeister, *Republ. Argent.* iii. pp. 457-8 (1879); and Flower, *Encycl. Brit.* (9) xiv. p. 738 (1882).

² *Sagg. S. N. Chili*, ed. 1, p. 317 (1782).

³ *Tom. cit.* p. 313.

⁴ This conclusion has been (with my entire knowledge and consent) utilized in Messrs. Flower and Lydekker's recent work on the Mammalia (p. 303). I think it better, however, still to publish the notes that I had previously written on the subject, as giving the reasons for an opinion which I am glad to have confirmed by two such able authorities. The same view was also suggested (with a query) by Sundevall (*K. Vet. Ak. Handl.* 1845, p. 292); but as he had not even seen a specimen of the Alpaca, his suggestion must be looked upon as a lucky shot.

1. LAMA HUANACHUS, Mol. The Huanaco.

Domestic races of 1 :—

a. *L. glama*, L. The Llama.b. *L. pacos*, L. The Alpaca.

2. L. VICUGNA, Mol. The Vicugna.

3. THE BUSH-BUCKS (*Tragelaphus*).

The larger species of this genus were worked out by Sir Victor Brooke¹ in 1871, and the only alteration which further material renders necessary in his account is that all the specimens from W. Africa, considered by him to belong to *T. spekei*, Scl., are really referable to *T. gratus*, Scl.

This well-marked species, described from a female skin in 1880², nine years after Brooke's paper, was really represented then by several skulls and horns in the Museum collection, viz. the specimens referred to by him under *T. spekei* as *b*, *d*, and *e* in his "List of specimens examined." The skin *e*, however, was in so bad a condition that the colour-characters did not give rise to a suspicion of specific distinction, and without such a suspicion the horns would be not unnaturally looked upon as, and compared with, immature horns of *T. spekei*. Knowing, however, the species *T. gratus* from Mr. Sclater's excellent figures, one may always readily distinguish the horns by their shortness, stoutness, and less amount of curve, the extra twist found in *T. spekei*, which approximates that species so much to *Strepsiceros*, being never found in the oldest examples of *T. gratus*. This is well seen on a comparison of Brooke's figure of *T. spekei* (*t. c.* p. 486) with that given by Sclater (*P. Z. S.* 1883, p. 36) of the head of the fine Gaboon specimen of *T. gratus* now in the British Museum.

The revised ranges of the four large species appear therefore to be as follows :—

1. *T. EURYCEROS*, Og.

Hab. W. Africa. Liberia (*Büttikofer*); Fantee (*Mus. Brit.*); Ashkankoloo Mountains, Gaboon (*Du Chaillu, Mus. Brit.*).

2. *T. ANGASI*, Angas³.

Hab. S.E. Africa. Pongola River, Zululand (*Eastwood, Mus. Brit.*); Maputa River (*Proudfoot, Mus. Brit.*); St. Lucia Bay (*Angas; Fellowes, Mus. Brit.*).

3. *T. GRATUS*, Scl.

Hab. West Africa. Kokki, Cameroons (*Allen, Mus. Brit.*); Gaboon (*Du Chaillu et al., Mus. Brit., Mus. Paris*).

¹ *P. Z. S.* 1871, p. 482.

² *P. Z. S.* 1880, p. 452.

³ Gray never published any description of this species, and therefore Mr. G. French Angas's account (*P. Z. S.* 1848, p. 89) must be taken as the original description. The species was named after Mr. G. Fife Angas, the father of Mr. G. French Angas, C.M.Z.S.

4. *T. SPEKEI*, Scl.

Hab. Central and South-central Africa. Karagweh, W. of Victoria Nyanza (*Speke, Mus. Brit.*); Chobe River, Upper Zambesi (*Selous and Chapman, Mus. Brit.*); Lake Ngami (*Green, Mus. Brit.*; *Oswell, fide Brooke*).

The characters and ranges of these larger species may now help us in the far more difficult task of the proper systematic arrangement of the smaller forms, *Tragelaphus scriptus* and its allies. In the larger Bush-bucks the four species are separated not only by colour, number of spots, stripes, &c., but also by definite structural characters, such as the length of the hoofs, the presence or absence of tufts of hair on the body, and the form of the horns; while in the smaller ones these characters are practically all identical. So far as I can discover, it is impossible to distinguish the horns of the West-African *T. scriptus* from those of the Abyssinian *T. decula* or the Cape *T. sylvaticus*; the hoofs are of the same length in all, and the quality and distribution of the fur shows but little variation. It would appear, then, that all the smaller Bush-bucks should be united as one species, but that within this species four subspecies should be recognized, these subspecies being practically based on colour alone. *T. decula* alone is rather more distinct than the rest and might by some authors be kept specifically separate, but more material from intermediate localities is needed before this point can be satisfactorily settled, and in the meantime it seems better to range it with *T. scriptus* rather than to erect it into a sixth species of the genus, with, at the best, characters so very much less in degree than those that separate the other five.

The synonymy and characters of the subspecies of *T. scriptus* may be briefly given as follows:—

5. *T. SCRIPTUS*, Pall.a. *T. SCRIPTUS DECULA*, Rüpp.

Antilope decula, Rüpp. N. Wirb. Abyss. p. 11, pl. iv. (1835).

Form shorter and stouter than in other subspecies. General colour more yellowish than rufous. Transverse bands nearly obsolete, but one high lateral longitudinal one present, sometimes broken into spots; haunches only spotted; dorsal line dark in both sexes. Chest and belly little darker than back.

Hab. Abyssinia. Salam River, Upper Atbara (*Mus. Brit.*); Lake Dembea (*Rüppell*).

b. *T. SCRIPTUS TYPICUS*, Pall.

Antilope scripta, Pall. Misc. Zool. p. 8 (1766) (*ex Buff.*).

A. phalerata, H. Sm., Griff. Cuv. An. K. iv. p. 275 (1827).

Colour bright rufous, brilliantly marked all over the body with numerous white spots and both longitudinal and transverse stripes. Dorsal band white in adult males. Chest with a blackish mane.

Hab. West, Central, and South-central Africa, covering very much the combined ranges of *T. gratus* and *T. spekei*. Senegal

(*Adanson*); Gambia (*Whitfield, Rendall*); Fantee (*Mus. Brit.*); Uganda (*Speke*); Chobe River, Upper Zambesi (*Selous*).

c. *T. SCRIPTUS ROUALEYNI*, Gord.-Cumm.

Antilopus roualeynei, Gord.-Cumm., Hunter's Life S. Afr. ii. p. 168 (1850).

Dark brown in the males, the transverse stripes reduced to two or three very obscure ones on the posterior part of the body, and even these sometimes absent in the oldest males, at least on the Limpopo. Spotting variable, generally less than in *T. scriptus* and more than in *T. sylvaticus*.

Hab. East Africa from British East Africa to the Limpopo. Manda Island off Witu (*Kirk*); Mombasa (*Kirk*); Lower Zambesi, east of the Victoria Falls (*Selous*); Limpopo (*Gordon-Cumming*).

Mr. Selous¹ considers the typical *roualeyni*, that found on the Limpopo, to be a slightly different form from that found on the Zambesi and the East Coast further northwards, and it is by no means impossible that the latter will hereafter be found to require varietal separation from *roualeyni*.

d. *T. SCRIPTUS SYLVATICUS*, Sparrm.

Antilope sylvaticus, Sparrm. Act. Holm. iii. p. 197, pl. vii. (1780).

Dark brown, with no transverse stripes in adult or young, and the spots reduced to quite a few indistinct ones on the haunches.

Hab. Cape Colony.

4. THE DWARF ANTELOPES (*Nanotragus* and *Oreotragus*).

The conclusions come to by Sir Victor Brooke in his paper on the Royal Antelope², are confirmed in most respects by the additional materials now available, and especially I can heartily endorse his fusion of the so-called genera *Calotragus*, *Scopophorus*, and *Nesotragus* with the earlier described *Nanotragus*. Apparently, however, the genus *Nanotragus* need not be split up into subgenera at all, if we remove from it the Klipspringer, the type of "*Oreotragus*," which Sir Victor has also included in *Nanotragus*, but which seems certainly to be worthy of separate generic rank. Thus it may be readily distinguished by its very differently shaped skull, its peculiar thick brittle hairs, and more especially by the shape of its hoofs, all the other species agreeing precisely among themselves and differing from it in these three characters. Its specific name should of course be *Oreotragus saltator*, and not *saltatrix*, the latter form being merely the feminine term applied to it when it was placed in "*Antilope*" by Boddaert. The other Dwarf Antelopes appear to form a group so natural as to be all probably placed in the restricted genus *Nanotragus*.

¹ P. Z. S. 1881, p. 752. 'Hunter's Wanderings in Africa,' p. 208 (1881). I must acknowledge my extreme indebtedness to this most valuable paper, which contains an excellent account of the Chobe, Zambesi, Limpopo, and Cape Bushbucks, drawn up from observations of many fresh specimens of both sexes and all ages.

² P. Z. S. 1872, p. 637 *et seqq.*